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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,237	12/07/2001	Bidyut K. Sen	03226/092001	5837

7590 04/08/2003

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EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/010,237

Applicant(s)

SEN, BIDYUT K.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed January 17, 2003.

Allowable Subject Matter

2. The indicated allowability of claims 8-17 is withdrawn in view of the newly discovered reference(s). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 2, 5 and 7 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Prior Art Figures.

In regards to claim 1, Applicant's Prior Art Figure discloses the following:

a) a housing having a bottom surface and a top surface, and an aperture is formed in a central portion thereof extending from the top surface to the bottom surface (See Figure 1 and Figure 2); and

b) capacitive material disposed within the housing to create a desired amount of capacitance (See Figure 2);

c) the bottom surface is provided with electrical connections adapted to be connected to a substrate (See Figure 1).

In regards to claim 2, Applicant's Prior Art Figure discloses the following:

a) aperture is rectangular (See Figure 2).

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In regards to claim 5, Applicant's Prior Art Figure discloses the following:

a) electrical connections provided on the bottom surface comprise a ball grid array (See Figure 1).

In regards to claim 7, Applicant's Prior Art Figure discloses the following:

a) the aperture is configured to fit over a semiconductor die, and wherein said electrical connections are configured for connection to a package substrate on which the semiconductor die is mounted (See Figure 2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Figures in view of Miller et al. (U.S. Patent No. 6,072,211).

In regards to claim 3, Applicant's Prior Art Figures fail to disclose the following:

a) the capacitive material comprises a layer of an electrically conductive material and a layer of a dielectric material.

However, Miller et al. ("Miller") discloses capacitive material (See Abstract). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Figures to include capacitive material as disclosed in Miller because it aids in shunting the inductance (See Abstract, Column 2 Lines 11-41).

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Additionally, since Applicant's Prior Art Figures and Miller are both from the same field of endeavor, the purpose disclosed by Miller would have been recognized in the pertinent art of Applicant's Prior Art Figures.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Figures in view of Miller et al. (U.S. Patent No. 6,072,211) and Barnett et al. (U.S. Publication No. 2002/0011354).

In regards to claim 4, Applicant's Prior Art Figures fail to disclose the following:

a) the housing is made from a plastic material.

However, Barnett et al. ("Barnett") discloses housing made from plastic (See Paragraph 0010). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Figures to include housing made from plastic as disclosed in Barnett because it aids in protecting the device from being damaged (See Figures 4-7).

Additionally, since Applicant's Prior Art Figures and Barnett are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Applicant's Prior Art Figures.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as obvious over Applicant's Prior Art Figures in view of Barnett et al. (U.S. Publication No. 2002/0011354) and Pape (U.S. Patent No. 6,215,171).

In regards to claim 6, Applicant's Prior Art Figures fails to disclose the following:

a) the housing comprised co-fired ceramic.

However, Barnett discloses housing and capacitive material made from co-fired ceramic (See Paragraph 0024). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Figures to include capacitive and housing material made from co-fired ceramic as disclosed in Barnett because it aids in providing high density and low cost devices (See Paragraphs 1-3).

Additionally, since Applicant's Prior Art Figures and Barnett are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Applicant's Prior Art Figures.

b) the capacitive material comprised of co-fired ceramic.

However, Pape discloses capacitive material made from co-fired ceramic (See Column 8 Lines 10-12). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Figures to include capacitive material made from co-fired ceramic as disclosed in Pape because it aids in determining the capacitance of capacitors (See Column 3 Lines 39-47 and Column 4 Lines 10-26 and Column 4 Lines 64-67).

Additionally, since Applicant's Prior Art Figures and Pape are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Applicant's Prior Art Figures.

9. Claims 8 and 11-13 are rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712).

In regards to claim 8, Mamodaly et al. ("Mamodaly") discloses the following:

a) a semiconductor die (1 and 9) mounted on a top portion of a top surface of a package substrate (See Figure 6).

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b) a capacitor having an aperture formed therein, and mounted on the top surface of the package substrate surrounding the semiconductor die (See Figure 6).

In regards to claim 8, Mamodaly et al. ("Mamodaly") fails to disclose the following:

a) a window frame.

Although Mamodaly does not specifically disclose a "windowframe" capacitor, "windowframe" is not deemed to exclude the combination of discrete elements. Mamodaly, discloses capacitors illustrated in a framed manner surrounding the die.

In regards to claim 11, Mamodaly fails to disclose the following:

a) the aperture is rectangular.

Although Mamodaly does not specifically disclose a rectangular aperture, an aperture is formed. It is design choice to have an aperture that is rectangular.

In regards to claim 12, Mamodaly discloses the following:

a) the capacitor comprises a housing (See Figure 6).

In regards to claim 13, Mamodaly discloses the following:

a) capacitor comprises a capacitive material disposed within said housing (See Figure 6).

10. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712) in view of Komiya et al. (U.S. Publication No. 2002/0011662).

In regards to claim 9, Mamodaly fails to disclose the following:

a) electronic component mounted on a top surface of the capacitor.

However, Komiya discloses the use of an electronic component mounted on a top surface of a capacitor (See Figure 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include

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the use of an electronic component mounted on a top surface of a capacitor as disclosed in Komiya because it aids in reducing the inductance (See Paragraph 5).

Additionally, since Mamodaly and Komiya are both from the same field of endeavor, the purpose disclosed by Komiya would have been recognized in the pertinent art of Mamodaly.

In regards to claim 17, Mamodaly fails to disclose the following:

a) the capacitor is mounted on the package substrate via a ball grid array.

However, Komiya discloses the use of a ball grid array (See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include a ball grid array as disclosed in Komiya because it aids in providing low impedance connections (See Paragraph 24).

Additionally, since Mamodaly and Komiya are both from the same field of endeavor, the purpose disclosed by Komiya would have been recognized in the pertinent art of Mamodaly.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712) in view of Komiya et al. (U.S. Publication No. 2002/0011662) and Tigelaar et al. (U.S. Patent No. 4,827,323).

In regards to claim 10, Mamodaly fails to disclose the following:

a) a second capacitor mounted on the first capacitor.

However, Tigelaar et al. ("Tigelaar") discloses capacitors stacked on each other (See Column 1 Lines 31-57). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include capacitors stacked on each other as disclosed in Tigelaar because they aid in increasing capacitance (See Column 1 Lines 31-57).

Additionally, since Mamodaly and Tigelaar are both from the same field of endeavor, the purpose disclosed by Tigelaar would have been recognized in the pertinent art of Mamodaly.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712) in view of Miller et al. (U.S. Patent No. 6,072,211).

In regards to claim 14, Mamodaly discloses the following:

a) the capacitive material comprises a layer of an electrically conductive material and a layer of a dielectric material.

However, Miller discloses capacitive material (See Abstract). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include capacitive material as disclosed in Miller because it aids in shunting the inductance (See Abstract and Column 2 Lines 11-41).

Additionally, since Mamodaly and Miller are both from the same field of endeavor, the purpose disclosed by Miller would have been recognized in the pertinent art of Mamodaly.

13. Claim 15 is rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712) in view of Miller et al. (U.S. Patent No. 6,072,211) and Barnett et al. (U.S. Publication No. 2002/0011354).

In regards to claim 15, Mamodaly fails to disclose the following:

a) the housing is made from a plastic material.

However, Barnett discloses housing made from plastic (See Paragraph 0010). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include housing made from plastic as disclosed in Barnett because it aids in protecting the device from being damaged (See Figures 4-7).

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Additionally, since Mamodaly and Barnett are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Mamodaly.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as obvious over Mamodaly et al. (U.S. Patent No. 4,839,712) in view of Miller et al. (U.S. Patent No. 6,072,211), Barnett et al. (U.S. Publication No. 2002/0011354) and Pape (U.S. Patent No. 6,215,171).

In regards to claim 16, Mamodaly fails to disclose the following:

a) the housing comprised co-fired ceramic.

However, Barnett discloses housing made from co-fired ceramic (See Paragraph 0024). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include capacitive and housing material made from co-fired ceramic as disclosed in Barnett because it aids in providing high density and low cost devices (See Paragraphs 1-3).

Additionally, since Mamodaly and Barnett are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Mamodaly.

b) the capacitive material comprised of co-fired ceramic.

However, Pape discloses capacitive material made from co-fired ceramic (See Column 8 Lines 10-12). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Mamodaly to include capacitive material made from co-fired ceramic as disclosed in Pape because it aids in determining the capacitances of capacitors (See Column 3 Lines 39-47 and Column 4 Lines 10-26 and Column 4 Lines 64-67).

Additionally, since Mamodaly and Pape are both from the same field of endeavor, the purpose disclosed by Barnett would have been recognized in the pertinent art of Mamodaly.

Response to Arguments

15. Applicant's arguments filed January 17, 2003 have been fully considered but they are not persuasive. First, Applicant argues that "Applicant's Prior Art figures fail to either inherently or explicitly disclose a capacitor having an aperture." However, this specific limitation (capacitor having an aperture) is not disclosed in the claim.

Finally, although Mamodaly does not specifically disclose a "windowframe" capacitor, the claim fails to define a windowframe capacitor as being a unitary device configured in the shape of a windowframe that encompasses substantially the entire available surface area. Additionally, it is not deemed to exclude the combination of discrete elements. Mamodaly, discloses capacitors illustrated in a framed manner surrounding the die.

Conclusion

16. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Newman (U.S. Patent No. 5,455,456) discloses an integrated circuit package lid; b) Dhuler (U.S. Patent No. 6,215,644) discloses high frequency capacitors; c) Cardinal (U.S. Patent No. 4,309,717) discloses a light detector housing; d) Shimizu et al. (U.S. Patent No. 6,239,486) discloses a semiconductor device; e) Val (U.S. Patent No. 4,654,694) discloses an electronic component box; f) Ellul et al. (U.S. Patent No. 5,394,000) discloses a trench capacitor; g) Peterson et al. (U.S. Patent No. 6,538,312) discloses a multilayered package; and h) Sato et al. (U.S. Patent No. 6,201,298) discloses a semiconductor device.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

April 4, 2003


AMIR ZARABIAN
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